Electronic Supplementary Material (ESI) for Lab on a Chip. This journal is © The Royal Society of Chemistry 2019

## **Electronic Supplementary Information**

**Video S1.** Video of repeated operations of the nanochannel open/close valve at a 180 s period (130× speed).

**Video S2.** Video of injection of fluorescein solution into the nanochannel under a 100 kPa pressure by opening the fL-valve (1× speed).